Math 112
LQuiz 12

2022–03–03 (R)

Your name: _____

Exercise

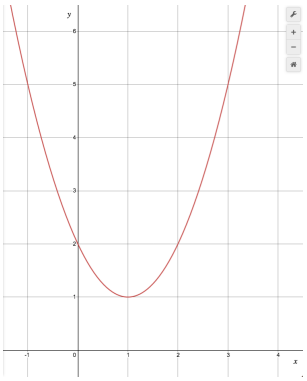
(4 pt) Let $f : \mathbf{R} \to \mathbf{R}$ be the function whose rule of assignment is

$$f(x) = x^2 - 2x + 2$$

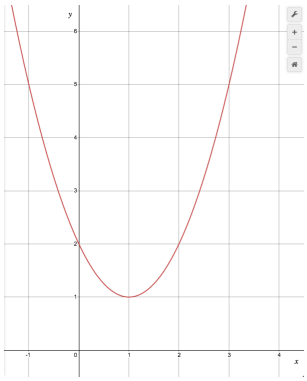
This exercise explores the area under the graph of f from $x = 0$ to $x = 3$, that is,

$$\int_0^3 f(x)\, dx \tag{1}$$

(a) (2 pt) The function f is graphed below, twice. Draw a lower sum and an upper sum, on separate graphs, each with three subintervals of length 1, for the definite integral in (1). Compute the values L and U, respectively, of these two sums.



Lower sum (L)



Upper sum (U)

(b) (2 pt) Find an antiderivative $F(x)$ of $f(x)$. Compute the difference $F(3) - F(0)$. Compare the result to the lower and upper sum you computed in part (a).